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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON SPIVAK MCCLELLAND MAIER & NEUSTADT PC
FOURTH FLOOR
1755 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202

EXAMINER

FUREMAN, JARED

ART UNIT

PAPER NUMBER

2876

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/692,371

Applicant(s)

KRUL ET AL.

Examiner

Jared J. Fureman

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-15 and 17-26 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Receipt is acknowledged of the IDS filed on 6/10/2002, the translation and amendment filed on 10/28/16/2002, all of which have been entered in the file. Claims 1-26 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4, 12, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haghiri et al (US 5,888,624) in view of Brown et al (Logic Gates Made From Polymer Transistors and Their Use in Ring Oscillators, cited by applicant).

Haghiri et al teaches a substrate (card body 3) which is made from paper and is provided with at least one integrated circuit (electronic module 1), wherein the integrated circuit is contactlessly readable integrated circuit (an electronic module suitable for noncontacting data exchange) which can be read in an inductive or capacitive manner, wherein the substrate comprises additional security features (see column 9 lines 51-54), wherein an additional security feature is fluorescent material (fluorescent fibers) (see figure 1, column 2 lines 31-56, column 3 lines 51-58, column 4 lines 38-45, and column 9 lines 51-54).

Haghiri et al fails to specifically teach the integrated circuit being a flexible integrated circuit comprising a semiconductive organic polymer, wherein the organic

polymer is selected from conjugated polymers, wherein the organic polymer is poly(thienylenevinylene), an insulating layer on the semiconductive organic polymer.

Brown et al teaches a flexible integrated circuit comprising a semiconductive organic polymer, wherein the organic polymer is selected from conjugated polymers, wherein the organic polymer is poly(thienylenevinylene), an insulating layer on the semiconductive organic polymer (see pages 972 and 974).

In view of Brown et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify, the substrate as taught by Haghiri et al, to include: the integrated circuit being a flexible integrated circuit comprising a semiconductive organic polymer, wherein the organic polymer is selected from conjugated polymers, wherein the organic polymer is poly(thienylenevinylene), an insulating layer on the semiconductive organic polymer, in order to provide a semiconductor that is less expensive than the conventional silicon chip (see Brown et al).

2. Claims 9-11, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haghiri et al as modified by Brown et al as applied to claim 1 above, and further in view of the admitted prior art.

Haghiri et al as modified by Brown et al fails to specifically teach wherein the integrated circuit comprises a preprogrammed code which is applied before incorporating the circuit in the substrate, wherein the integrated circuit comprises a code of an intrinsic property of the substrate, which code, after the substrate is produced, is

arranged in the integrated circuit, wherein the code is an encrypted code, wherein the paper has a thickness up to 100 μm .

The admitted prior art teaches that it was well known in the art at the time of the invention to provide an integrated circuit that comprises a preprogrammed code which is applied before incorporating the circuit in the substrate (see the specification page 7 line 31 - page 8 line 15), wherein the integrated circuit comprises a code of an intrinsic property of the substrate, which code, after the substrate is produced, is arranged in the integrated circuit (see the specification page 7 line 31 - page 8 line 15), wherein the code is an encrypted code (see the specification page 7 line 31 - page 8 line 15), and that for banknote paper the thickness of the substrate usually lies in the range of up to 100 μm (see the specification page 4 lines 35-37).

In view of the admitted prior art, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the substrate, as taught by Haghiri et al as modified by Brown et al, to include: the integrated circuit comprises a preprogrammed code which is applied before incorporating the circuit in the substrate, wherein the integrated circuit comprises a code of an intrinsic property of the substrate, which code, after the substrate is produced, is arranged in the integrated circuit, wherein the code is an encrypted code, wherein the paper has a thickness up to 100 μm , in order to provide greater security for the substrate, and to provide banknotes with greater security.

5. Claims 14, 15 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haghiri et al as modified by Brown et al as applied to claim 1 above, and further in view of Giustiniani et al (EP 0 753 623 A2, cited by applicant).

Haghiri et al as modified by Brown et al fails to specifically teach, a security document comprising the substrate, the security document being a banknote, a passport, identity card, or a security.

Giustiniani et al teaches a security document comprising a substrate, the security document being a banknote (currency bill), passport, identity card, or a security (a check) (see page 2 lines 3-8, 42-44, and page 3 lines 27-34).

In view of Giustiniani et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the substrate, as taught by Haghiri et al as modified by Brown et al, to include: a security document comprising the substrate, the security document being a banknote, passport, identity card, or a security, in order to provide greater security against counterfeiting for documents that require an anti-forgery system.

6. Claims 8, 17 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haghiri et al as modified by Brown et al, further in view of Bratchley et al (US 6,155,605, previously cited).

The teachings of Haghiri et al as modified by Brown et al have been discussed above. Haghiri et al also teaches providing the integrated circuit with electrical contacts (12) (see figure 1 and column 4 lines 38-45, note that the integrated circuit can be contact or non-contact).

Haghiri et al as modified by Brown et al fails to specifically teach wherein the integrated circuit forms part of an optically active element, wherein the optical active element is a hologram.

Bratchley et al teaches a substrate having an optically active element (a foil or hologram) included with another security feature (another entity) (see column 4 line 36 - column 5 line 26).

In view of Bratchley et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system as taught by Haghiri et al as modified by Brown et al, wherein the integrated circuit forms part of an optically active element, wherein the optical active element is a hologram, in order to provide greater security.

7. Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haghiri et al as modified by Brown et al as applied to claim 1 above, and further in view of Uetani et al (JP 8-259709, previously cited).

Haghiri et al as modified by Brown et al fails to specifically teach the substrate further comprising polyimide having polyaniline blocks thereon underneath the semiconductive organic polymer, the substrate having an uppermost layer of polyaniline.

Uetani et al teaches the use of a polyimide having a polyaniline for a semiconductor sheet (see the translation of the abstract).

In view of Uetani et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the system as taught by

Haghir et al as modified by Brown et al, the substrate further comprising polyimide having polyaniline blocks thereon underneath the semiconductive organic polymer, the substrate having an uppermost layer of polyaniline, in order to provide a semiconductor that is stable even when environmental conditions fluctuate.

Allowable Subject Matter

3. Claim 16 has been allowed over the prior art of record.
4. Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for allowance and the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to teach or fairly suggest: a security thread comprising an insulating support bearing a flexible integrated circuit comprising a semiconductive organic polymer provided with electrical contacts for the integrated circuit, a conductive security thread which is connected to the integrated circuit, the security thread serving as a contact for readout operations and for current supply, in combination with the other claimed limitations as set forth in the claims.

While various prior art of record (for example: Giustiniani EP 0 753 623 A2, Kaule et al US 5,112,672, and Schneider US 4,763,927) teach conductive security threads, the prior art of record does not teach security threads having a flexible integrated circuit comprising a semiconductive organic polymer. As discussed above, Brown et al teaches semiconductive organic polymers useful for low-end data storage and cheap

integrated electronic circuits. However, Brown et al only provides motivation for replacing conventional silicon chips with the semiconductive organic polymers.

Therefore, without the benefit of applicant's invention, there is no motivation for one of ordinary skill in the art at the time of the invention to combine the teachings of the prior art in a manner so as to create the claimed invention.

Response to Arguments

6. Applicant's arguments with respect to the Lazzerini reference have been considered but are moot in view of the new ground(s) of rejection. As discussed above, Haghiri et al is now being used as the primary reference.

7. Applicant's other arguments filed 8/16/2002 have been fully considered but they are not persuasive.

In response to applicant's argument that the Office has not provided any examples of paper substrates containing conventional silicon-based integrated circuits (see page 4 of the amendment filed on 8/16/2002), the newly cited reference to Haghiri et al teaches a silicon-based integrated circuit (electronic module 1) placed on a paper substrate (card body 3) (see figure 1, column 2 lines 31-56, and column 3 lines 51-58).

In response to applicant's argument that the Office has not presented any evidence of polymer-based integrated circuits on paper substrates, the only evidence of record that a polymer-based integrated circuit can be combined with a paper substrate is the disclosure in the present application, there is no disclosure in the Brown et al reference that the prior art semiconductor devices can be used on paper substrates (see page 4 of the amendment filed on 8/16/2002), it is noted that applicant's

specification contains a very broad definition of "paper" (see page 2, lines 30-34). Applicant's definition of "paper" includes natural or synthetic fibers, and even plastic films. Brown et al teaches that the polymer-based integrated circuit can be printed directly onto plastic substrates (see the first column on page 972). Thus, Brown et al meets applicant's definition of "paper".

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case Haghiri et al teaches a conventional silicon-based integrated circuit on a paper substrate, and Brown et al teaches replacing a conventional silicon-based integrated circuit with a polymer-based integrated circuit, in order to save cost (see the first column on page 972 and the first column on page 974, of Brown et al).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re*

Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Haghiri et al teaches a conventional silicon-based integrated circuit on a paper substrate, and Brown et al teaches replacing a conventional silicon-based integrated circuit with a polymer-based integrated circuit, in order to save cost (see the first column on page 972 and the first column on page 974, of Brown et al). Thus, the motivation (to save cost) to combine Brown et al with Haghiri et al comes directly from the teachings of Brown et al.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schneider et al (US 5,876,068), Kaule et al (US 5,112,672), Schneider (US 4,763,927) all teach conductive security threads. Moskowitz et al (US 5,528,222), Hofmann (WO 01/69523 A1), Foertsch (DE 196 30 648 A1), Brosow (DE 198 49 762 A1), Houdeau (DE 100 52 402 A1), and Arrieta (EP 1 179 811 A1) all teach security documents containing integrated circuits. Paper Based Document Security - A Review, by Rudolf L. van Renesse discusses authentication methods for security papers. Plastic Electronics Based on Semiconducting Polymers, by M. Schrodner et al. discusses the possible uses of plastic based semiconductors.

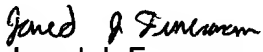
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared J. Fureman whose telephone number is (703) 305-0424. The examiner can normally be reached on 7:00 am - 4:30 PM M-T, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (703) 305-3503. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Jared J. Fureman
November 2, 2002